

## **REMARKS**

Claims 1-27, 29, 31-33, and 53-65 are pending. Claims 1, 4, 7, 9, and 31-33 have been amended. Claim 11, 21-23, 29, and 53-55 have been previously presented. Claims 2, 3, 5, 6, 8, 10, 12-20, and 24-27 are original. Claims 28, 30, and 34-52 have been canceled. Claims 56-65 are new. No new matter has been introduced by the amendment.

### **1. Claim Rejections under 35 U.S.C. § 103(a)**

#### **A. Claim 1-8**

Claims 1-8 have been rejected under 35 U.S.C. §103(a) over McEntee et al. (U.S. Pat. Pub. No. 2004/0050701) in view of Paolini et al. (U.S. Pat. Pub. No. 2002/0131147). The Applicants respectfully traverse the rejections based on the following remarks.

Applicants traverse the 103(a) rejections on the grounds 1) that McEntee teaches away from using any surfactant in its ionization droplets, the modification proposed by the Examiner, and 2) that there is no reason to combine McEntee and Paolini. Accordingly, the Applicants respectfully submit that McEntee in view of Paolini do not teach or suggest all the claimed limitations as recited in amended independent claims 1, 4, and 7.

As discussed in the response to the final Office Action, McEntee teaches selective deposition from ionized droplets. While McEntee stretches its definition of ionized droplets to include a form of an emulsion, McEntee does not teach the use of a surfactant in such an emulsion, as the Examiner has conceded (final Office Action, pages 4 and 6). Further, in paragraph [0097] of McEntee, to which the Examiner has referred us, there is no teaching of use of any surfactant, let alone

one that does not significantly reduce the electrical conductivity of the insulative continuous phase, as required by amended independent claims 1, 4, and 7.

Applicants traverse the Examiner's assertion that "[s]ince Applicant's arguments regarding McEntee et al teaching away from use of surfactant are based on the steps that are not claimed, arguments are not persuasive" (Advisory Action, page 2). As discussed in the response to the final Office Action, McEntee does not address the issue of, for instance, the use of an insulative continuous phase that could prevent the aqueous reactant discontinuous phase from wetting and subsequently depositing on the required site because of the lack of surfactant. The Applicants do not argue that electrical conductivity and wetting are recited in amended independent claims 1, 4, and 7. Rather, the Applicants submit that the fact that McEntee is not addressing any problem which requires the use of any surfactant is teaching away from the use of any surfactant in its ionized droplets. An emulsion comprising a surfactant is required by amended independent claims 1, 4, and 7. A rationale for the teaching away argument does not need to be recited by the pending claims.

Further, the Examiner has conceded that McEntee does not teach an emulsion comprising a surfactant having a first part which is compatible with the continuous phase and a second part which is compatible with the discontinuous phase and not significantly reducing the volume resistivity of the continuous phase (final Office Action, page 6). It follows that if Paolini does not teach or suggest this limitation, the Examiner's *prima facie* case of obviousness fails. Under these circumstances, individual attack on Paolini will be sufficient to traverse the obviousness rejections over McEntee and Paolini because the Examiner has conceded that McEntee does not teach the required limitation.

As discussed in the response to the final Office Action, there is no reason to combine McEntee with Paolini, and the alleged combination uses impermissible

hindsight. The Examiner asserts that an emulsion comprising a surfactant having a first part which is compatible with the continuous phase and a second part which is compatible with the discontinuous phase and not significantly reducing the volume resistivity of the continuous phase was known in the art at the time of the claimed invention was made as taught by Paolini (final Office Action, page 6). Paolini, however, is for a quite different purpose, to form an electrophoretic display (see paragraph [0004], lines 1-6). While Paolini uses an emulsion, there is no teaching or suggestion that such a material could be used for selective deposition. In fact, the emulsion material disclosed in Paolin is in the form of a gel and is placed over the entire surface, and once the gel has set, charge on the substrate enables particles in droplets suspended in the set gel to realign to give visible patterns (see paragraph [0020], lines 1-20).

The Examiner asserts that “[s]ince both McEntee et al and Paolini et al are interested in moving droplets using electric field, it would be obvious to combine the references” (Advisory Action, page 2). The mere fact that two references are in the same general field does not render them combinable if the references themselves teach otherwise. Here, the Examiner has conceded that “McEntee et al teaches generation of droplets and controlling the volume of the droplet to deposit on the surface at *predetermined location*”, that is, selective deposition (Advisory Action, page 2; emphasis added). In sharp contrast, as discussed above, Paolini teaches placing an emulsion containing a surfactant over an *entire* substrate.

Further, Paolini uses a gel emulsion where the continuous phase is water and materials dissolved in the continuous phase such as gelatine, polyvinyl alcohol etc that forms a continuous film when spread on a substrate (see paragraph [0022]). Paolini explicitly teaches dispersing a range of polymers in the continuous phase.

“Aqueous external phases in this process may include dispersion polymers, such as lattices, urethane dispersions, silicones and

epoxies, and solution polymers such as poly(vinyl alcohol) and polyvinylpyrrolidone. Film-forming materials which may be useful include lower consolute temperature polymers such as N-isopropylacrylamide, and highly shear thinning, high low-shear viscosity polymers such as gums, xanthan, carageenan, associative thickeners, and cellulosic gelling agents, which may also form the continuous phase matrix. Silicone polymers may be used in the continuous phase where stability of the medium is of major concern. Also, the continuous phase may comprise a pressure-sensitive adhesive to improve adhesion of the electrophoretic medium to the substrate.” (See paragraph [0039]).

In other words, the gel (emulsion) disclosed in Paolini is an aqueous gel which is not an electrically insulative continuous phase. See also paragraphs [0022], [0023] and [0024] of Paolini. In sharp contrast, McEntee teaches an emulsion including an electrically insulative continuous phase (paragraph 0097; final Office Action, page 4). The Examiner fails to explain why a surfactant used with an aqueous, non-electrically insulative continuous phase, such as in Paolini, would teach the use of the surfactant in an electrically insulative continuous phase. Accordingly, the Applicants respectfully submit that there is no reason to combine McEntee and Paolini.

The Examiner asserts that Paolini teaches “a plurality of embodiments including an emulsion comprising the preferred anionic or non-ionic surfactants”, referring to paragraph 0041 (Advisory Action, page 2). The mere fact that the surfactants are either anionic or non-ionic does not tell anything about whether an emulsion has an electrically insulative continuous phase. For example, Paolini expressly teaches that the emulsion is an aqueous gel. In other words, the

continuous phase as taught by Paolini is not electrically insulative no matter the surfactants are anionic or non-ionic.

In addition to the fact that McEntee and Paolini are not combinable, the asserted combination does not teach or suggest all the claim limitations as recited in amended independent claims 1, 4, and 7. The Examiner has conceded that McEntee does not teach an emulsion comprising a surfactant that does not significantly reducing the volume resistivity of the continuous phase, as required by amended independent claims 1, 4, and 7 (final Office Action, page 6). The Examiner asserts that Paolini teaches the emulsion comprising a surfactant that does not significantly reducing the volume resistivity of the continuous phase, as required by amended independent, referring to paragraph 0041 (final Office Action, page 6). The Examiner, however, fails to establish any reasoning for this conclusive assertion. Accordingly, the Applicants respectfully submit that neither McEntee nor Paolini teaches or suggests an emulsion comprising a surfactant not significantly reducing the volume resistivity of the continuous phase.

Amended independent claims 1, 4, and 7 further recite that “the substrate comprises a support, a conductive layer on the support, a dielectric layer of a material which will hold an electric charge disposed on the conductive layer and the chemically functional layer on the dielectric layer”. Support for amended independent claims 1, 4, and 7 can be found in Applicants’ specification, for example, in original claim 30. In contrast, McEntee relates to electrode type substrates (see Fig. 10). The Examiner asserts that McEntee teaches a chemically functional layer (final Office Action, pages 9-10). The Examiner, however, does not explain which layer in McEntee is the asserted chemically functional layer. If the Examiner attempts to argue that once the molecules are deposited, they are the chemically functional layer, the Applicants respectfully submit that the deposited molecules are not part of the substrate.

In view of the above, the Applicants respectfully submit that McEntee in view of Paolini do not teach or suggest all the claimed limitations as recited in amended independent claims 1, 4 and 7; that there is no reason to combine McEntee and Paolini except impermissible hindsight; and that McEntee teaches away from the use of surfactant in an emulsion. Accordingly, the rejections against amended independent claims 1, 4, and 7, and thus the rejections against claims 2-3, and 5, 6, 8, which all depend from amended independent claims 1 and 4, respectively, are improper and should be withdrawn.

**B. Claims 9-27, 29, And 31-33**

Claims 9-27, 29, and 31-33 have been rejected under 35 U.S.C. §103(a) over McEntee in view of Montgomery (U.S. Pat. No. 6,280,595) further in view of Paolini. The Applicants respectfully traverse the rejections based on the following remarks.

As discussed in section 1A above, McEntee and Paolini do not teach or suggest any surfactant having a first part which is compatible with the continuous phase and a second part which is compatible with the discontinuous phase, and not significantly reducing the volume resistivity of the continuous phase as recited in amended independent claim 9. There is no reason to combine McEntee and Paolini except for impermissible hindsight. McEntee teaches away from the use of surfactant in an emulsion. McEntee and Paolini do not teach or suggest the substrate comprises a support, a conductive layer on the support, a dielectric or photoconductive layer of a material which will hold an electric charge disposed on the conductive layer and the chemically functional layer on the dielectric or photoconductive layer. Montgomery does not overcome these deficiencies of McEntee and Paolini.

Further, there is no reason to combine Montgomery with McEntee and Paolini. Montgomery teaches solid phase electro-chemical synthesis from an aqueous solution onto electrodes on a substrate with the electrodes set up in a particular pattern (see Abstract). There is no teaching or suggestion that anything other than a solution of the necessary chemical can be used to selectively deprotect these electrode sites for deposition of the solid phase chemicals. The solutions contemplated in Montgomery are aqueous (see Column 12, lines 1 to 15). In contrast, McEntee uses an electrically insulative continuous phase. The asserted modification of McEntee which has an electrically insulative continuous phase by Paolini and Montgomery, both of which have a non-electrically insulative continuous phase, would defeat the purpose of McEntee.

In view of the above, the Applicants respectfully submit that McEntee in view of Montgomery and further in view of Paolini do not teach or suggest all the claimed limitations as recited in amended independent claim 9. Accordingly, the rejections against independent claim 9, and thus the rejections against claims 10-27, 29, and 31-33, which all depend from amended independent claim 9, are improper and should be withdrawn.

## **2. New Claims 56-65**

New claims 56-65 depend from amended independent claims 1, 4, and 7. As discussed in Section 1 above, amended independent claims 1, 4, and 7 are patentable over cited references. It follows that dependent claims 56-65 are patentable as well, without more. Support for new claims 56-65 can be found in Applicants' specification, for examples, in original claims 31-33, and in page 11, lines 6-9.

### 3. Conclusion

Based on the above, the Applicants respectfully submit that the claims are in condition for allowance. The Examiner is kindly invited to contact the undersigned agent to expedite allowance.

Respectfully submitted,

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